

Flight test - Required. 18/04

Work Order ID 68088

Wednesday, April 06, 2011 11:39:24 AM

Page 1

PRELIMINARY ISSUE

D: D206-667-107BL

Accept

Revision ID: PRELIM

Item Name: 206 Fwd Crosstube

Start Date: 4/6/2011 Start Qty: 1.00

Required Date: 4/18/2011 Req'd Qty: 1.00

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw.Nbr

Revision Nbr

D206-667-147

Rev. A

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D206-667-107

110

0.00



Pick Kit

Packaging

Packaging

Memo

0.00

Packaging

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D206-667-147 using CNC bender program

N/A 11-4-11

8 u105b2

CHG001

DP

11-4-11

DP

11-4-11

11-5-27

**Work Order ID 68088**

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Item ID: D206-667-107BL

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Setup Start



Revision ID: PRELIM

Stop



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Start Date: 4/6/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 4/18/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

130

QC15- Crosstube Dimensional Check

0.00

*to PM 1 Day only*  
*8:00am*

QC:

Memo

0.00

Quality Control

**Work Order ID 68088**

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Wednesday, April 06, 2011 11:39:24 AM

Item ID: D206-667-107BL

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Setup Start



Revision ID: PRELIM

Stop



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Cust Item ID:

Required Date: 4/18/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

140

0.00



Crosstubes

0.00

Crosstubes

**Memo**

1-Drill holes &amp; ream using drill Jig DT &amp; DT as per Dwg D206-667-147. Drill all (3) top holes.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT &amp; DT as per Dwg D206-667-147. Drill only the top (2) holes.

5-Drill pilot holes as per Dwg D206-667-147. Drill only the top (2) holes.

6-Drill Fwd rivet holes using drill Jig DT as per Dwg D206-667-147.  
Note: Fwd side has 3x top holes.

7-Drill Aft rivet holes using drill Jig DT as per Dwg D206-667-147.

8-C'sink holes as per Dwg D206-667-147. Allow rivet to sit below surface to compensate for paint.

9-Scribe part # and batch # using vibrating stylus as per Dwg D206-667-147.  
Inside of Cuff (Do not engrave on outside of tube)

10-Deburr &amp; Inspect for surface damage. Repair damage within limits as per Dwg D206-667-147

SAD 11-04-12

11-4-12

**Work Order ID 68088**

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Wednesday, April 06, 2011 11:39:24 AM

Item ID: D206-667-107BL

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Setup Start



Revision ID: PRELIM

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Item Name: 206 Fwd Crosstube

Start Date: 4/6/2011 Start Qty: 1.00



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Required Date: 4/18/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

SAD 11-04-12 ①

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

11 04 12 ①

170

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

11.04.12 ①

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Item ID: D206-667-107BL

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Setup Start

Stop

Start Date: 4/6/2011 Start Qty: 1.00

Required Date: 4/18/2011 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

180

Outsource process - NDT per QSI038 4.1

0.00



Outsource2

Memo

0.00

Outsource process - NDT

CROSSTUBES

P/O: 13857

P/O: 13989

CX 11/04/13 ①

CX 11/05/12 ①

190

Packaging

0.00



Packaging

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

CX 11/04/13 ①

CX 11/05/12 ①

200

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

CX 11-04-14

CX 11.05.12 ①

# Work Order ID 68088

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Item ID: D206-667-107BL

Accept



Setup Start



Revision ID: PRELIM

Item Name: 206 Fwd Crosstube

Stop



Start Date: 4/6/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 4/18/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



Stop

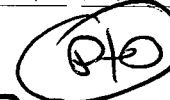


Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210	SprayPaint	0.00							
	SprayPaint								
Spray Painting	Memo	0.00							
	1-Prime inside and outside crosstube as per QSI 005 4.2								
	2-Paint outside crosstube with White Imron as per QSI 005 4.2								
	PRIME:								
	Start Time: _____								
	Finish Time: _____								
	PAIN:								
	Start Time: _____								
	Finish Time: _____								
220	QC14- Inspect Spray Paint	0.00							
	QC								
Quality Control	Memo	0.00							
	Wrap in plastic bag to protect from scratches								

primer 117319  
Paint 115985  
clear 117101

RT 11-04-14

RT 11-05-25



11 04 15

11 05 - 26

Blue Bell

~~Primer only per SS/CF~~  
11-04-06  
OK topz

W/O: 68088		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
11-05-09	210	<del>remove supports</del> Grind off remaining magnesium feather paint edge using Scotch brite or 320 grit paper re-align	ML	11/05/09		Q51042 11.05.09	W/0617	
11-05-09	210	re-paint blue as per Q58 005	BT	11-05-29				

Part No: D206-661-107 BL PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Item ID: D206-667-107BL

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Revision ID: PRELIM

Item Name: 206 Fwd Crosstube

Start Date: 4/6/2011 Start Qty: 1.00

Required Date: 4/18/2011 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

230

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Install support using 0.03" to 0.06" thick layer of magnobond 6398 per QSI 015. Let cure for 12h after installation and prior to packaging. Note: (2) Aft holes should be facing up.  
A/R Magnobond 6398: 116677

2-Install supports and clamps as per Dwg D206-667-147. Torque clamps to 80-100 in lb

3-Install nut plates as per Dwg D206-667-147. Touch-up rivet heads with Imron paint.

RT 11-04-15  
RT 11-05-26

ATO

240



QC

Quality Control

QC5- Inspect part completeness to step on W/O

Memo


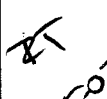



0.00 → Inspector Assembly  
to Rev A Dwg.  
0.00  
8/10/12

RT 11 04 18 (1)



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D 206-667-107BL PAR #: \_\_\_\_\_ Fault Category: X-tube NCR: Yes ☐ No ☒ DQA: 11 Date: 11.06.14  
 Resolution: Rework Disposition: Rework QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR: <u>68088</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
11.05.04	230	Several marks in tube from removing supports. RC: LOA	 11.05.04 090412	Buff out marks. O.D. is $\phi 2.240$ in one location wall $\phi 0.240$ WITHIN TOLERANCE OF $\phi 6002$ . Acceptable.	 11.05.03	 11.05.03	 11.05.04 090412	 11.05.03

NOTE: Date & initial all entries

W/O: 68088		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.05.26	230	re assemble using blue supports D2891-1 B62595 + B50952 + new clamps M521920-20 m 116799 scrap old clamps have old supports re worked + returned to stock as per B# 70114	BT	11.05.26		W 11.05.27	S 11.06.17

Part No: D206-667-107 BL PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

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Item ID: D206-667-107BL

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Revision ID: PRELIM

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Start Date: 4/6/2011 Start Qty: 1.00

Required Date: 4/18/2011 Req'd Qty: 1.00

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool # Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

250

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

N/A CP 11.04.19

11/5/2011

260

QC4- 100% Inspect kits for completeness

0.00



QC

Quality Control

8/16/2011  
Memo

0.00

to Rec A Bay.

N/A CP 11.04.19

270

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D206-667-107  
Location: \_\_\_\_\_  
PPP Rev: \_\_\_\_\_

N/A CP 11.04.19

Cuppr @

# Work Order ID 68088

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Item ID: D206-667-107BL

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Revision ID: PRELIM

Item Name: 206 Fwd Crosstube

Start Date: 4/6/2011 Start Qty: 1.00

Required Date: 4/18/2011 Req'd Qty: 1.00

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

Stop

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

280

QC21- Final Inspection - Work Order Release.

0.00



QC

Memo

0.00

Quality Control

*Test. PA  
11.04.20*

*11/5/30*

*11-05-30*

POSITIVE RECALL

EFFECTIVE 11-04-00 AUTH W  
RELEASED AP DATE 11.05.25

# Picklist Print

Wednesday, April 06, 2011 11:39:21 AM

Page 1

Work Order ID: 68088

Parent Item: D206-667-107BL

Parent Item Name: 206 Fwd Crosstube





Start Date: 4/6/2011

Required Date: 4/18/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: revA 11.01.13 New Issue EC verified by:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
AN5-30A  BOLT		Purchased	No				Each	61.0000	24	4			
<div> <div>Location</div> <div>ST339</div> <div>114941</div> <div>116003</div> </div> <div> <div>Loc Qty</div> <div>61</div> <div>11</div> <div>50</div> </div> <div> <div>Loc Code</div> <div></div> <div></div> <div></div> </div>													
AN5-32A  Bolt		Purchased	No				Each	153.0000	24	4			
<div> <div>Location</div> <div>ST340</div> <div>115108</div> <div>115589</div> <div>117161</div> </div> <div> <div>Loc Qty</div> <div>153</div> <div>43</div> <div>60</div> <div>50</div> </div> <div> <div>Loc Code</div> <div></div> <div></div> <div></div> <div></div> </div>													
AN5-7A  Bolt		Purchased	No				Each	178.0000	210	10			
<div> <div>Location</div> <div>ST337</div> <div>116516</div> <div>117313</div> </div> <div> <div>Loc Qty</div> <div>178</div> <div>78</div> <div>100</div> </div> <div> <div>Loc Code</div> <div></div> <div></div> <div></div> </div>													
AN960JD516  Washer	NAS1149D0563J	Purchased	No				Each	0.0000	218	18			
<div> <div>Location</div> <div>ST337</div> <div>116516</div> <div>117313</div> </div> <div> <div>Loc Qty</div> <div>178</div> <div>78</div> <div>100</div> </div> <div> <div>Loc Code</div> <div></div> <div></div> <div></div> </div>													

11/5/291 11/5/270

# Picklist Print

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Work Order ID: 68088

Parent Item: D206-667-107BL

Parent Item Name: 206 Fwd Crosstube

Start Date: 4/6/2011

Required Date: 4/18/2011

Start Qty: 1.00

Required Qty: 1.00

AN970-4

Purchased

No

Each

90.0000

712 12



Washer



11/5/078

## Location

## Loc Qty

## Loc Code

ST344

26

107242

10

115936

16

ST349

64

116900

64

Each

1.0000

1

D206-667-147TRN

Manufactured

No



Crosstube Ass'y

368088



SAD 11-04-11

## Location

## Loc Qty

## Loc Code

LG003

1

65111

1

Each

24.0000

2

D2873-043

Manufactured

No



Nut Plate Assembly



RT 11-04-18

## Location

## Loc Qty

## Loc Code

LG052

24

65375

4

66898

20

Each

19.0000

2

D2873-045

Manufactured

No



Nut Plate Assembly



RT 11-04-18

## Location

## Loc Qty

## Loc Code

LG052

19

65992

19

x2

Wednesday, April 06, 2011 11:39:21 AM

Shop Packet Print

Page 2

# Picklist Print

Wednesday, April 06, 2011 11:39:21 AM

Work Order ID: 68088

Parent Item: D206-667-107BL

Parent Item Name: 206 Fwd Crosstube

Start Date: 4/6/2011

Required Date: 4/18/2011

Start Qty: 1.00

Required Qty: 1.00

D2891-1 Manufactured No



2.25 Support

Each 26.0000

2

*BS 50952 x1*  
*Returned to stock as per*  
*BS 70114*

Location	Loc Qty	Loc Code
LG052	26	
53773	20	
62595	6	



*BT 11-04-15*

D3595-063-395 Manufactured No



RUBBER CUSHION

Each 69.0000

4

Location	Loc Qty	Loc Code
LG055	69	
63368	17	
65361	52	



*BT 11-04-15*

cut (4)0.063" X 3.95"

MS20601-AD4W8 Purchased No



RIVET

Each 221.0000

14

Location	Loc Qty	Loc Code
LG	100	
108521	100	
LG051	121	
116119	21	
117106	100	



*BT 11-04-15*

*x14*

# Picklist Print

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Work Order ID: 68088

Parent Item: D206-667-107BL

Parent Item Name: 206 Fwd Crosstube

Start Date: 4/6/2011

Required Date: 4/18/2011

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased

No

Each

849.0000



Nut



4

11/3/28

## Location

## Loc Qty

## Loc Code

ST300

849

115594

89

116105

500

116548

260

MS21920-20

Purchased

No

Each

80.0000



Clamp (per MIL-DTL-8783C)



4

BT 11-04-15

## Location

## Loc Qty

## Loc Code

LG050

80

116799

30

117279

50

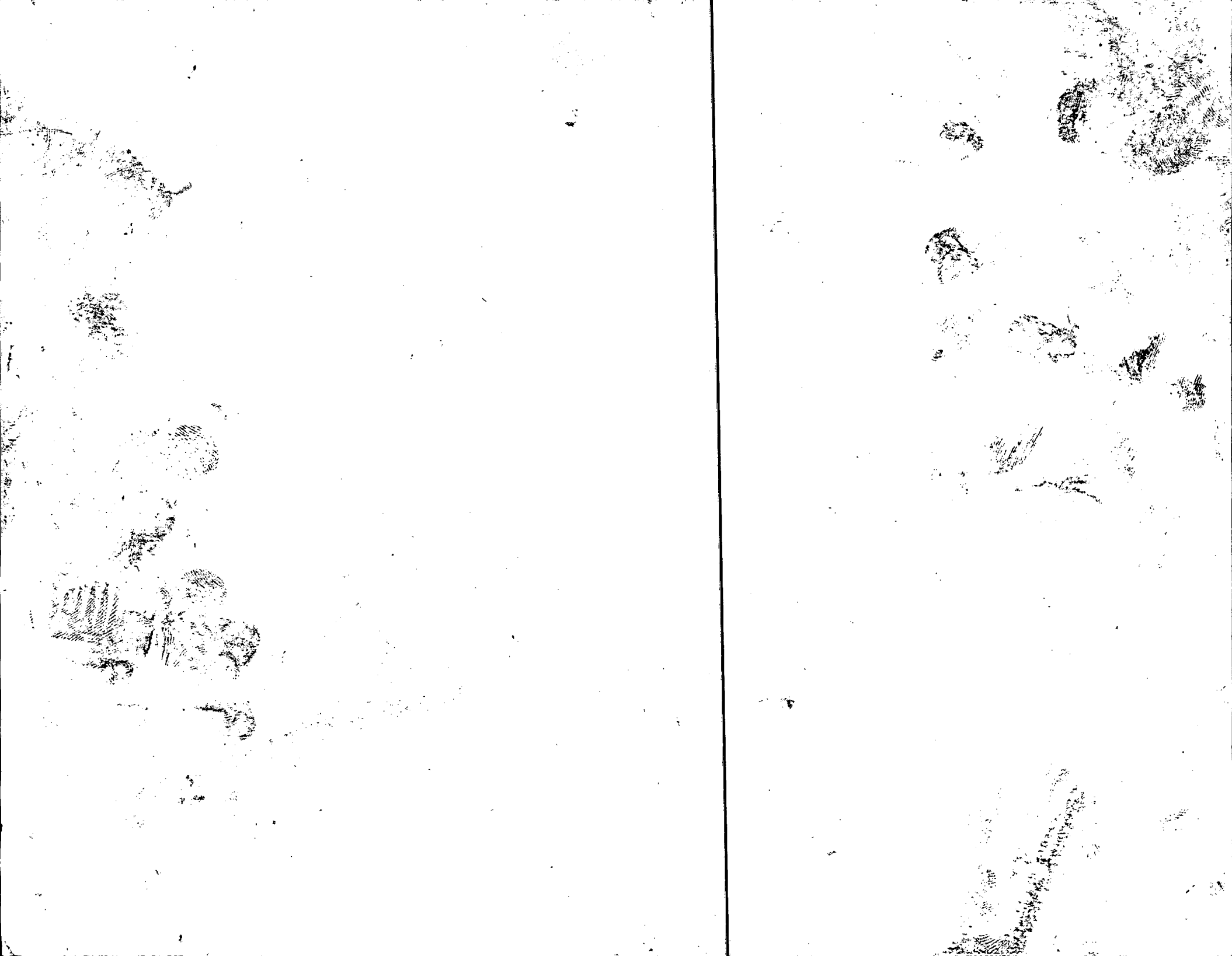
X4 X4 BT 11-05-26

Wednesday, April 06, 2011 11:39:22 AM

Shop Packet Print

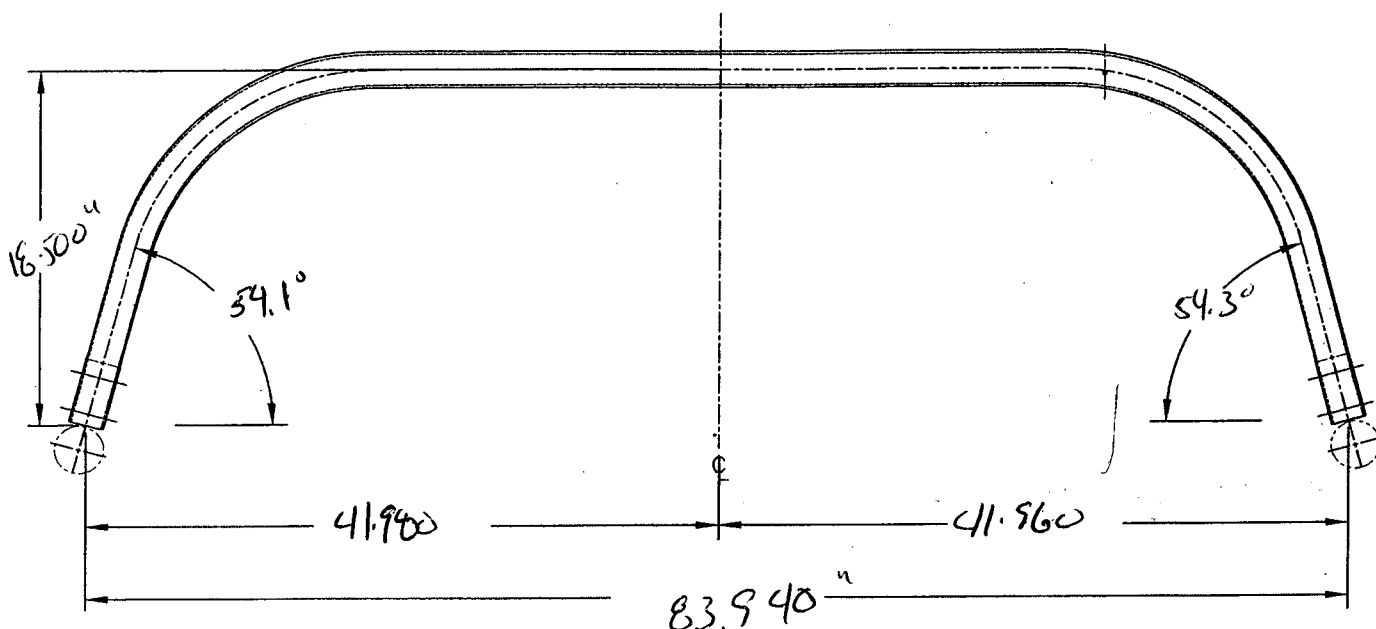
Page 4





DART AEROSPACE LTD		Work Order:	68088
Description: Crosstube		Part Number:	D206-667-107
Inspection Dwg: D206-667-107		Rev: P31	Page 1 of 1

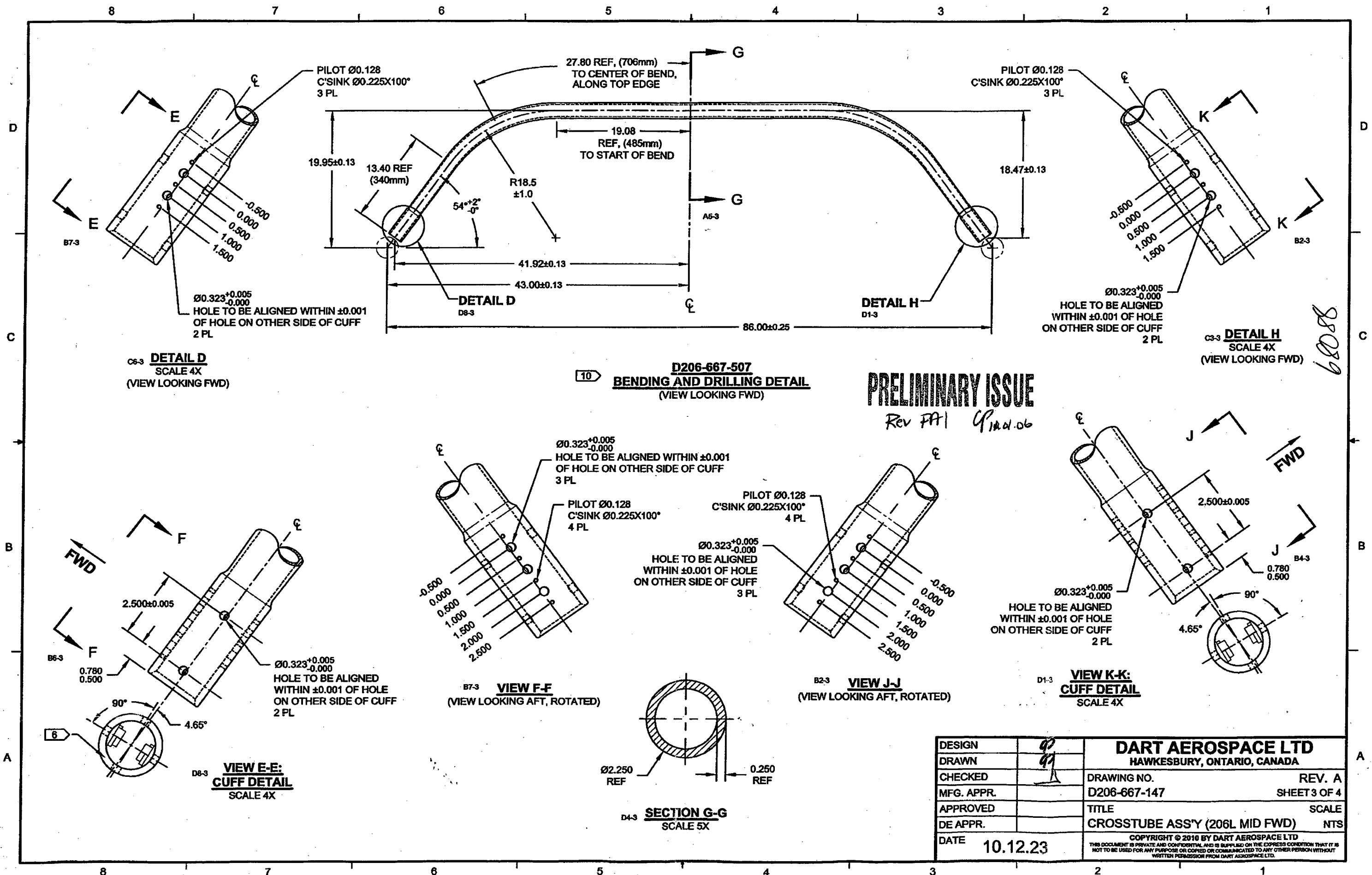
Required Dimension	Min	Max
Height 18.47 $\pm .13$	18.34"	18.60"
1/2 Span 41.92 $\pm .8$	41.75"	42.05"
Angle 54.1 $\pm .2$	54°	56°
Total Span	83.58"	84.10"



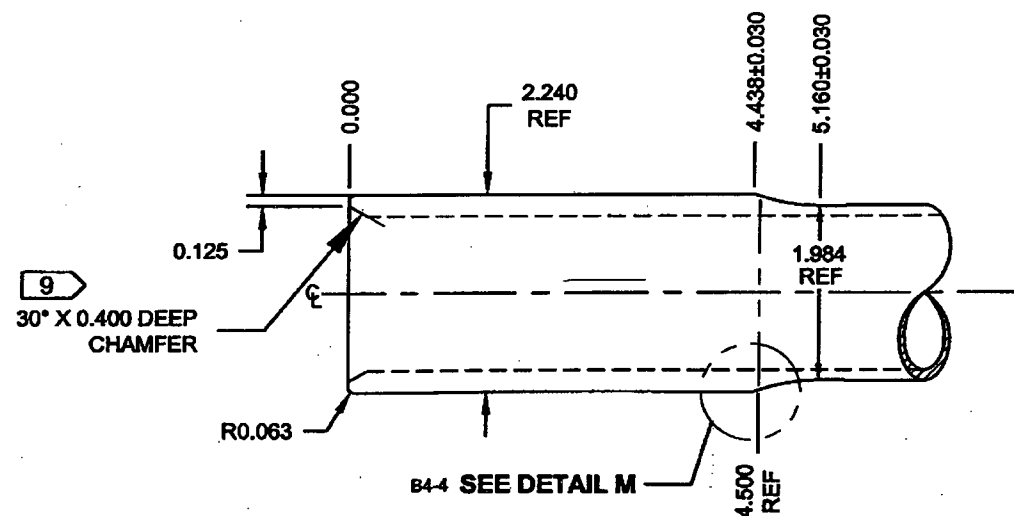
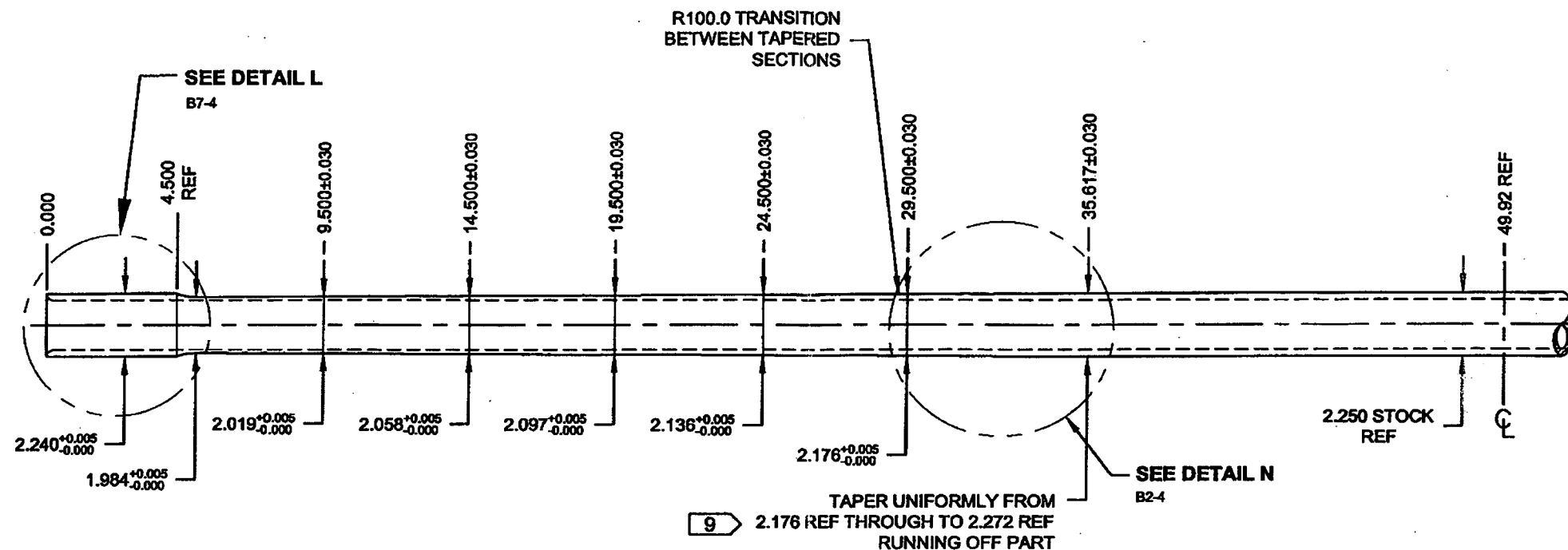
Comments
Acceptable 11.04.11

QC15 Inspection	8
Date	11/04/11

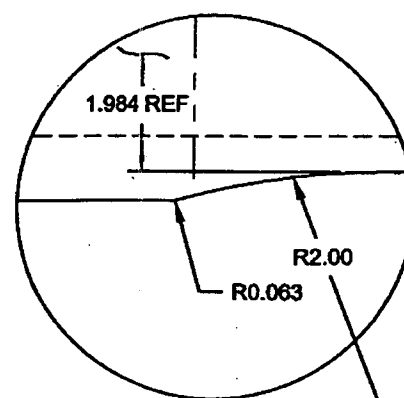
Rev	Date	Change	Revised by	Approved
		New Issue		





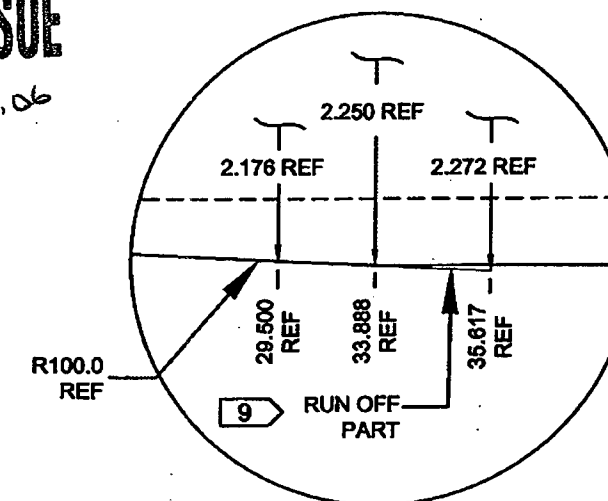


D7-4 **DETAIL L:**  
**CROSSTUBE CUFF**  
NOT TO SCALE



A6-4 **DETAIL M:**  
**CUFF TRANSITION**  
NOT TO SCALE

**PRELIMINARY ISSUE**  
REV. PA1 11.01.06



C4-4 **DETAIL N:**  
**TAPER RUN-OFF**  
NOT TO SCALE

DESIGN	92	<b>DART AEROSPACE LTD</b>	
DRAWN	92	HAWKESBURY, ONTARIO, CANADA	
CHECKED	92	DRAWING NO.	REV. A
MFG. APPR.		D206-667-147	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (206L MID FWD)	NTS
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

68088



Item	Qty -147	Part Number	Description
1	X	D206-667-147	CROSSTUBE ASSEMBLY (206L MID FWD)
2	1	D6002-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3595-063-395	RUBBER CUSHION
7	4	MS21920-20	CLAMP (OR MS21920-21)
8	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299- 947-100, TYPE II, CLASS 2 ADHESIVE)

**GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6002-115  
FINISHED LENGTH = 99.84±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-147" AND BATCH NUMBER ON  
INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS).
- 7) WEIGHT: 15.0 lbs (-507 = 12.84)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY,  
TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 10 PASSES. MAXIMUM TUBE FLATTENING DUE  
TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI  
015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE  
THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS  
ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE  
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS  
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT  
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN  
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

**PRELIMINARY ISSUE**

Rev #71 CP 10.01.06

PA	NEW ISSUE	CP	10.11.23
REV.	DESCRIPTION	BY	DATE
DESIGN	CP	DART AEROSPACE LTD	
DRAWN	CP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	CP	DRAWING NO.	REV. A
MFG. APPR.		D206-667-147	SHEET 1 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (206L MID FWD)	NTS
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	





8 7 6 5 4 3 2 1

12 D2891-1 SUPPORT  
2 PL

15 MS21920-20 CLAMP  
4 PL

13 D3595-063-395  
RUBBER CUSHION  
4 PL, (UNDER CLAMP)

13.08

D206-667-507

A4-2

D206-667-147  
ASSEMBLY DETAIL  
(VIEW LOOKING FWD)

PRELIMINARY ISSUE  
Rev PA1 CP 11.01.06

B7-2

B2-2

D2873-043  
NUT PLATE

MS20601AD4W8  
RIVET, 4 PL

D2873-045  
NUT PLATE

MS20601AD4W8  
RIVET, 3 PL

90°  
REF

VIEW A-A:  
CUFF DETAIL  
SCALE 4X

C7-2

FWD

6°

13 15  
MS21920-20 CLAMP REF

12  
D2891-1 SUPPORT REF

D3595-063-395  
RUBBER CUSHION  
REF

D5-2 SECTION B-B  
SCALE 5X

D2873-043  
NUT PLATE

MS20601AD4W8  
RIVET, 4 PL

D2873-045  
NUT PLATE

MS20601AD4W8  
RIVET, 3 PL

90°  
REF

VIEW C-C:  
CUFF DETAIL  
SCALE 4X

C2-2

DESIGN	92	DART AEROSPACE LTD	
DRAWN	91	HAWKESBURY, ONTARIO, CANADA	
CHECKED	12	DRAWING NO.	REV. A
MFG. APPR.		D206-667-147	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (206L MID FWD)	NTS
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD	
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68089



Item	Qty -147	Part Number	Description
1	X	D206-667-147	CROSSTUBE ASSEMBLY (206L MID FWD)
2	1	D6002-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3595-063-395	RUBBER CUSHION
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8	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
9	A/R	MAGNOBOND 8398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 298- 947-100, TYPE II, CLASS 2 ADHESIVE)

#### GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6002-115  
FINISHED LENGTH = 99.84±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-147" AND BATCH NUMBER ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS).
- 7) WEIGHT: 15.0 lbs (-507 = 12.84)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 10 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 8398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

68088

**RELEASED**  
2011-05-23

A	NEW ISSUE	CP	10.11.23
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.12.23		

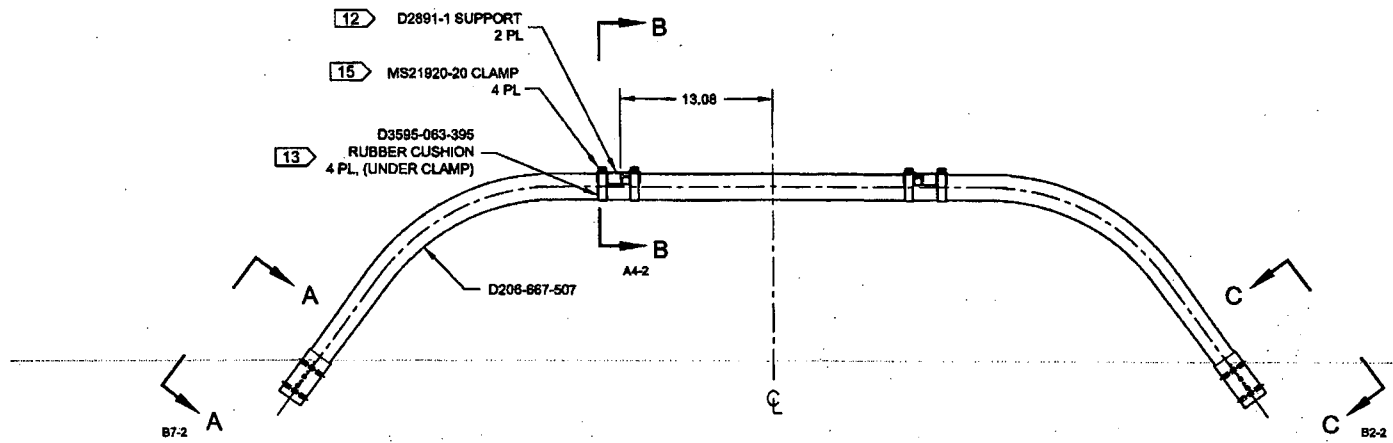
**DART AEROSPACE LTD**  
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. D206-667-147  
TITLE CROSSTUBE ASSY (206L MID FWD)  
SCALE NTS

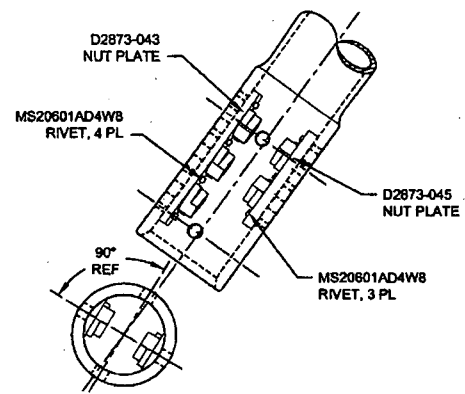
REV. A  
SHEET 1 OF 4

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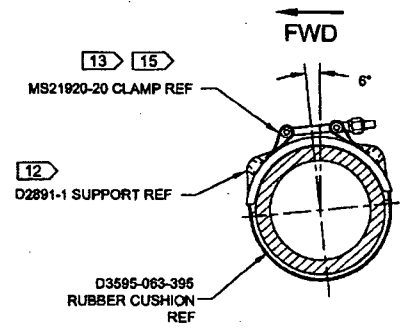
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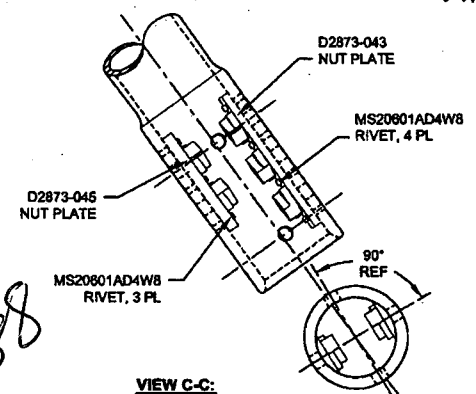
**RELEASED**  
2011-05-24



**VIEW A-A:  
CUFF DETAIL**  
SCALE 4X  
C7-2



**SECTION B-B**  
SCALE 5X  
D6-2

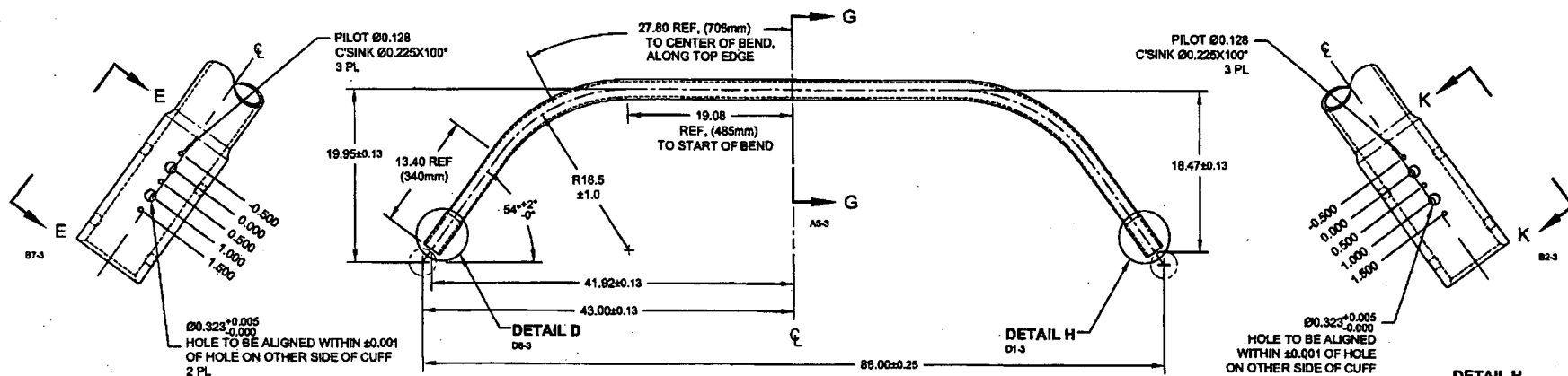


**VIEW C-C:  
CUFF DETAIL**  
SCALE 4X  
C2-2

DESIGN	90	<b>DART AEROSPACE LTD</b>	
DRAWN	91	HAWKESBURY, ONTARIO, CANADA	
CHECKED	92	DRAWING NO.	REV. A
MFG. APPR.	93	D206-667-147	SHEET 2 OF 4
APPROVED	94	TITLE	SCALE
DE APPR.	95	CROSSTUBE ASS'Y (206L MID FWD)	NTS
DATE	10.12.23	<small>COPYRIGHT © 2010 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR FOR ANY COMMERCIAL OR OTHER PURPOSE WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

8 7 6 5 4 3 2 1

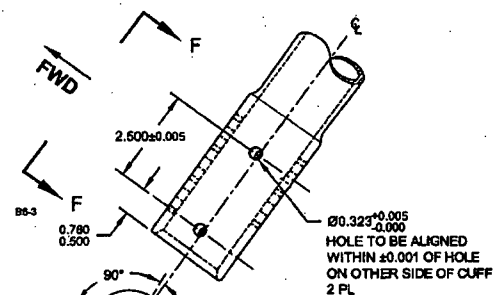
8 7 6 5 4 3 2 1



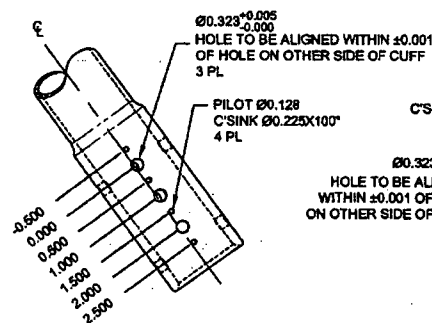
**DETAIL D**  
SCALE 4X  
(VIEW LOOKING FWD)

**D206-667-507**  
**BENDING AND DRILLING DETAIL**  
(VIEW LOOKING FWD)

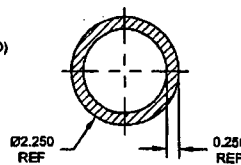
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SCALE 4X  
(VIEW LOOKING FWD)



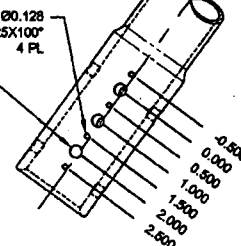
**VIEW E-E:**  
**CUFF DETAIL**  
SCALE 4X



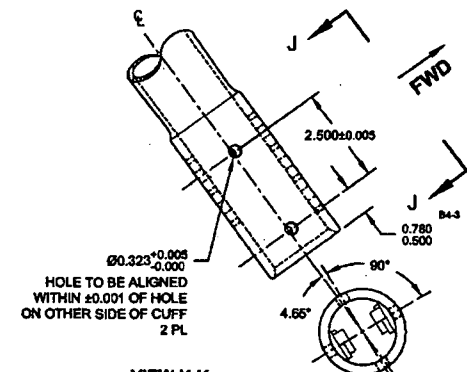
**VIEW F-F**  
(VIEW LOOKING AFT, ROTATED)



**SECTION G-G**  
SCALE 5X



**VIEW J-J**  
(VIEW LOOKING AFT, ROTATED)



**VIEW K-K:**  
**CUFF DETAIL**  
SCALE 4X

**RELEASED**  
2011-05-24

DESIGN		<b>DART AEROSPACE LTD</b>	
DRAWN	<i>91</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.	<i>13</i>	D206-667-147	SHEET 3 OF 4
APPROVED	<i>140</i>	TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (206L MID FWD)	NTS
DATE	10.12.23	COPYRIGHT © 2016 BY DART AEROSPACE LTD THIS DOCUMENT IS PRELIMINARY AND CONFIDENTIAL AND IS SUPPLIED TO THE BUYER ON THE CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMUNICATED TO ANY OTHER PERSON WITHOUT THE WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

D

C

B

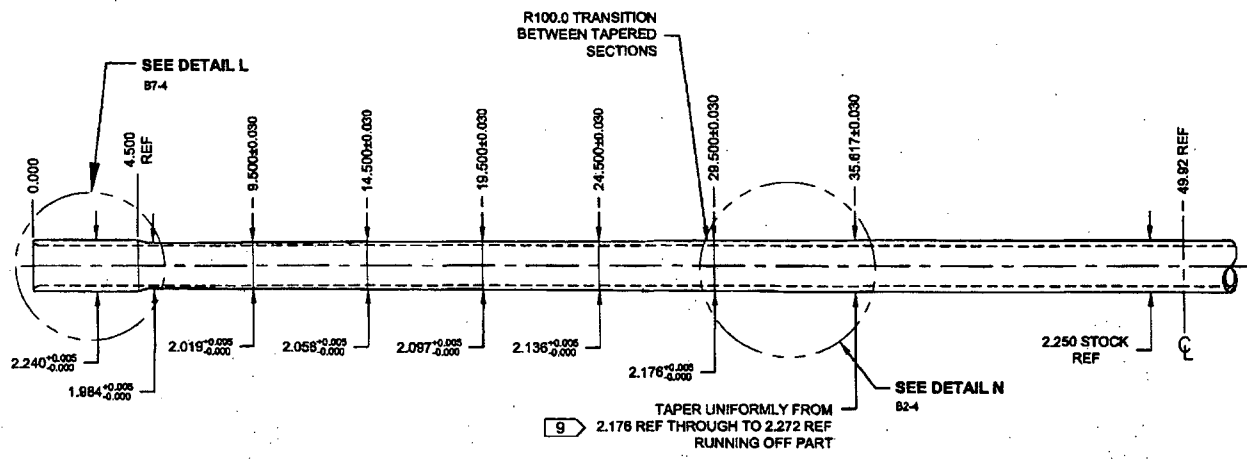
A

D

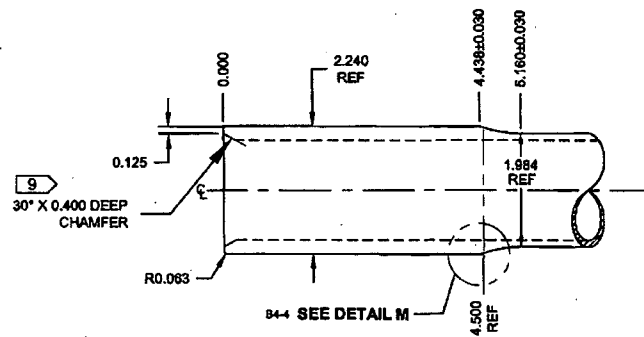
C

B

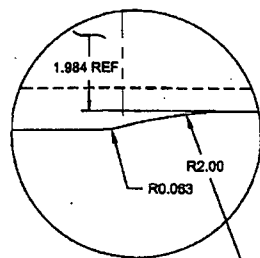
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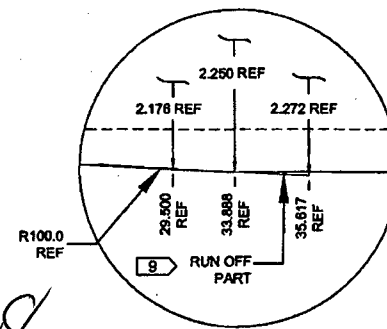
**TURNING DETAIL**



**DETAIL L:  
CROSSTUBE CUFF**  
D7-4 NOT TO SCALE



**DETAIL M:  
CUFF TRANSITION**  
A6-4 NOT TO SCALE



**DETAIL N:  
TAPER RUN-OFF**  
C4-4 NOT TO SCALE

**RELEASED**  
2011-05-13

DESIGN	99	<b>DART AEROSPACE LTD</b>	
DRAWN	99	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.	99	D208-667-147	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (206L MID FWD)	NT
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD	
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8 7 6 5 4 3 2 1

REFERENCE ONLY

DART AEROSPACE LTD.

IIN-D206-667

Page 18 of 19

5.2 MID-HEIGHT CROSSTUBES

Item	Qty -107	Qty -207	Part Number	Description
	X/		D206-667-107	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 MID FWD
		X	D206-667-207	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 MID AFT
7	1		D206-667-147	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 MID FWD
8		1	D206-667-247	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 MID AFT
10	*2		D2891-1	SUPPORT
11		*2	D2892-1	SUPPORT
13	*4		D3595-063-395	RUBBER CUSHION
14		*4	D3595-063-450	RUBBER CUSHION
16	*4		MS21920-20	CLAMP
17		*4	MS21920-22	CLAMP
19	4		AN5-32A	BOLT
20		4	AN5-34A	BOLT
21	4	4	MS21042L5	NUT (OR MS21042-5)
22	8	8	NAS1149C0563J	WASHER (OR AN950JD516)
40	*2	*2	D2873-043	NUT PLATE
41	*2	*2	D2873-045	NUT PLATE
44	10		AN5-7A	BOLT
45		10	AN5-10A	BOLT
46	4		AN5-30A	BOLT
47		4	AN5-32A	BOLT
48	12		AN970-4	WASHER (OPTIONAL)
50	10	10	NAS1149C0563J	WASHER (OR AN960JD516)

\*REFERENCE ONLY. PARTS ARE INCLUDED IN D206-667-147/-247 ASSEMBLIES ABOVE

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Revision: D  
Date: 11.05.01



# HeathAir

INTERNATIONAL (1991) INC.

681 Ave. Lepine, Dorval, Québec H9P 1G3  
Tél.: 514 636-1000 • Fax: 514 636-0031

W.O. 44191

A.M.O. Number: 46/90

## NON-DESTRUCTIVE TESTING REPORT

### AIRCRAFT COMPONENT INFORMATION

REGISTRATION:

MODEL/TYPE:

SERIAL NUMBER:

TOTAL HR/LDG:

OPERATED BY:

BASED AT:

### INSPECTION REQUIREMENTS

Carry out FPI of (4) cross tubes (external surface) as per ASTM E-1417-05 and the Dart QSI 038, Section 4.1.1 (on file at client) - parts delivered to HeathAir.

Qty (2) P/N D212-664-101 S/N's B67866 and B67867.

Qty (1) P/N D206-667-207BL S/N B68089.

Qty (1) P/N D206-667-107BL S/N B68088.

Sales Order Ref.: 230626

Contact: Chantal Lavoie at 613-632-5200 for pick-up.

*BT 11-04-14*

☐ RADIOGRAPHY

☐ ULTRASONIC

☒ PENETRANT

☐ MAGNETIC PARTICLE

☐ EDDY CURRENT

### INSPECTION REPORT

Fluorescent penetrant inspection was performed in accordance with the above requirements on (4) cross tubes.

Note: A Level 3 penetrant was substituted for the requested Level 2 (3 is more sensitive) Ardrex 970P25E Batch #04B503.

(4) cross tubes inspected. (4) PASSED / (0) FAILED.

THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH  
THE APPLICABLE STANDARDS OF AIRWORTHINESS

DATE April 13, 2011

INSPECTED BY: *[Signature]*

### CUSTOMER INFORMATION

CUSTOMER: Dart Aerospace

P.O. NUMBER

Chantal

ADDRESS:

CONTACT NAME:

LABOUR

@

\$

MATERIALS

@

TRAVEL EXPENSES

@

GST

HOTEL EXPENSES

@

PST

INVOICE NO.

PO 13857

TOTAL \$

WHITE COPY - INSPECTION FILE • YELLOW COPY - CUSTOMER • PINK COPY - ACCOUNTANT





## LIQUID PENETRANT TEST REPORT

P- 05602

CLIENT

ATTENTION

ADDRESS

PROJECT

ITEM(S) EXAMINED

DATE

ACUREN JOB NO.

PO/WO NO.

WORK LOCATION

ACCEPTANCE STD.

PAGE

OF

TIME

AM

PM

JOB DESCRIPTION

PROCEDURE NO. LT-002 REV./DATE 2008

TECHNIQUE NO. LT-002 REV./DATE 2008

PART NO.

MATERIAL ALUMINUM

THICKNESS N/A

SCOPE

## TEST DETAILS

METHOD

☒ FLUORESCENT☐ VISIBLE☒ WATER WASH☐ SOLVENT REMOVABLE☐ POST EMULSIFIED

FAMILY BRAND MAGNAFLUX

BLACK LIGHT S/N 13798 OUTPUT > 1000  $\mu$ W/cm<sup>2</sup> AMBIENT < 2 fc

ENETRANT

ZL-67

MINIMUM DWELL TIME

10

MIN.

LIGHTING EQUIP.

☐ FLASHLIGHT☐ TROUBLELIGHT☐ OUTPUT > 100 fc @ SURFACE

ENETRANT REMOVER

H<sub>2</sub>O

MINIMUM DRY TIME

&gt;10

MIN.

OTHER

DEVELOPER

SKD/SD

MINIMUM DWELL TIME

10

MIN.

LIGHT METER S/N

CAL DUE DATE AUG/05/00

DEVELOPER TYPE

☒ NON AQUEOUS☐ AQUEOUS☐ DRY

## TEST SURFACE

SURFACE CONDITION

☐ AS GROUND☐ AS WELDED☐ MACHINED☐ SHOT BLASTED☒ CLEAN BARE METAL

SURFACE TEMPERATURE

☐ < -4°C/ 20°F☐ -4°C/ 20°F TO 10°C/ 50°F☒ 10°C/ 50°F TO 52°C/ 125°F☐ > 52°C/ 125°F

## RESULTS-

☐ METRIC ☐ IMPERIAL

1 CROSSSTUBE (2 REPAIRS AREA) W.O. ID 67378 ✓  
2 CROSSSTUBE W.O. ID 67376 ✓  
3 CROSSSTUBE W.O. ID 67378 ✓  
4 CROSSSTUBE W.O. ID 67973 ✓  
5 CROSSSTUBE W.O. ID 67974 ✓

ITEM ID: D200-664-107BL REVID PRELIM (see Fwd)

ITEM ID D202-664-201 AFT

ITEM ID D202-664-201 AFT

ITEM ID D202-664-101 Fwd

ITEM ID D202-664-101 Fwd

NO RELEVANT INDICATION WAS DETECTED  
AS PER APPLICABLE STANDARD

11-05-02

## Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

## Standard of Care

performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

## SIGNATURES

CLIENT REPRESENTATIVE

PRINT

SIGNATURE

DTR # E44845

TECHNICIAN (SIGNATURE):

VIVES DESROSIERS

REPORT

REVIEWED BY:

NAME (PRINT):

NAME

INITIALS

CGSB LEVEL

SNT LEVEL

CGSB LEVEL

SNT LEVEL

CGSB REG. NO.

3049

CGSB REG. NO.